ascom

Smarter Alarm Management

For Early Detection of Patient Deterioration

Alarm fatigue: a systemic challenge

Imagine being a nurse, bombarded with up to **350 alarms** *per patient per day in general care, and double that in the ICU[1.] Deciphering which alarms are actionable versus non-actionable is a daunting task. Studies show that if an alarm is accurate* **90% of the time,** *responses are equally high. However, if accuracy drops to* **10%,** *so does the response rate[2]. This inconsistency in alarm reliability puts unnecessary pressure on nurses, many of whom are experiencing burnout, or considering retirement. At a time when healthcare is wrestling with nursing shortages and a "experience-complexity" gap with new nurses joining the workforce, we need solutions that enhance patient care and retain nurses, not drive them away.*

The real risk of alarm fatigue

Alarm fatigue isn't just a nuisance; it's a significant risk to patients, a burden to clinicians and a threat to outcomes. Hospitals must implement robust alarm management protocols to mitigate accordingly. Fortunately, advanced clinical workflow technology solutions are available. These solutions integrate clinical collaboration and communication with alarm and alert management, enhancing clinical efficiency and patient care and delivering a proven return on invesment (ROI).

Planning for your investment

This buying guide will help you as a healthcare or IT professional in your hospital, to understand key factors to consider before you buy an alarm and alert management solution. With the goal of obtaining the most from your healthcare investments which typically involve long replacement cycles, learning how this type of solution can leverage your existing technologies is important.

Priority areas for hospitals considering alarm and alert management solutions:

1. **Highest standards for cybersecurity and compliance.**
   Check that your solution is FDA cleared for secondary alarm notification and that it meets the highest security standards, like compliance with the Department of Defense's Risk Management Framework (RMF), National Institute of Standards and Technology (NIST) and Federal Information Processing Standards (FIPS). Data protection of patients' private health information under the General Data Protection Regulation (GDPR) and the Health Insurance Portability and Accountability Act (HIPPA) guidelines is a must.

2. **Medical device integration.** Make sure your solution has the capability to integrate with and monitor output from medical devices connected to your patients. This will ensure that you get near real time status of a patient's condition, with clinical surveillance dashboards (Fig. 1) and mobile apps, augmenting the electronic health record (EHR). Your smart alarm and alert management solution should complement the EHR as a system of action.

3. **Part of a unified clinical communication and collaboration solution.** Factor staff communications into your workflow design, which involves the right combination of processes and technologies including:
   - Staff assignments
   - Alert routing and escalation
   - Code team activation
   - Voice calling and secure messaging
   - Active Directory interface
   - Single sign-on (SSO and OpenID integration)

4. **Scalable design.** Invest in modern technology and architecture that provides you scalability and interoperability as your facilities and requirements expand. Look for partners with established support organizations and software maintenance and technology migration/refresh programs.

5. **Vendor neutral**. As you add new solutions, ensure they can accommodate both backward and forward compatibility to existing and future technologies. Alarming and alerting solutions have the potential to interface with hundreds of devices and clinical applications that will open the door for more advanced alarming, alerting and predictive care models.
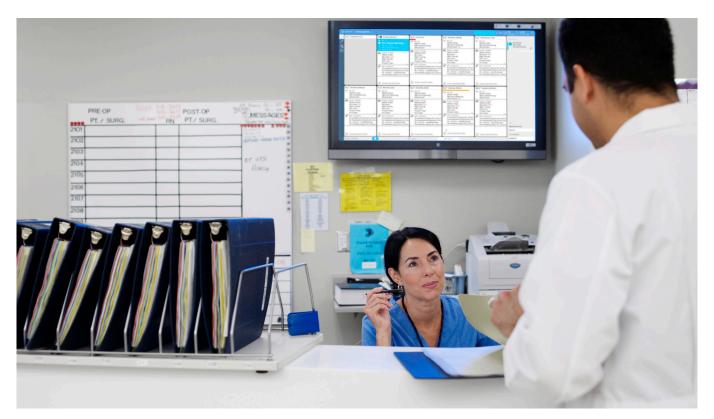

Fig. 1 - Example of Ascom software enabling enhanced clinical surveillance

Buyer's key question list

Alarm and Alerting Capabilities

	Fill in (other vendor)	Vendor 1 (actual vendor)	Vendor 2 (actual vendor)	**Ascom**
Configurable, multi-parameter rules engine for connected medical devices, clinical applications and observations				✔
CDS rules include Threshold, Expression and EWS type rules				✔
Combines continuous and sporadic vitals for surveillance and CDS scoring				✔
Vendor neutral integration with medical devices and systems				✔
Live waveforms and waveform snippets with parameter values				✔
Centralized and mobile notifications of alarms with sound and color to highlight medical device alarms and warnings occurring on any connected device				✔
Access to historical data and trends in graphical and tabular formats with configurable filtering and timelines				✔
Configurable alarm / alert notification filtering options to include group, delay and stop filters				✔
Ad hoc and configurable reporting capabilities to support data analytics and continuous improvement				✔
Cleared as 510k Class II Medical Device under FDA. Full compli- ance with IEC 60601-1-8:2020 and 80001-2-5:2014				✔
Data protection and cyber security supporting regulations, e.g. HIPAA, FIPS, and RMF				✔

Ascom's smarter alarm manager's key benefits

Ascom, the smarter alarm manager, helps you get the most out of your smart alarming and alerting solution with a combination of capabilities that set it apart from the rest.

1. **Gives you more actionable information**
   Ascom's dynamic rules engine allows the degree of customization necessary to support clinical observation objectives. Despite all the disparate data coming from your patients, we create a single pane of glass that leverages integrated analytics for optimal situational awareness on any patient at any time. The result is actionable insights for better outcomes.

   From smarter alarming and alerting to clinical surveillance, we're making new care models possible, including the Digital Central Monitoring Unit (DCMU).

2. **Proven ROI**
   Ascom can help you calculate your ROI using your unique parameters. Consider that payback for an Ascom smart alarming and alerting solution could be as little as 18 months generating substantial ROI[3].

Learn more about our ROI method on our website.

3. **Integrates into your environment**
   Ascom's platform is vendor neutral and integrates with hundreds of medical devices and systems, including nurse call systems, patient monitors, ventilators, IV pumps, virtual care platforms and much more.

   Our solutions are highly configurable so you can set parameters by patient, unit, floor, etc. With Ascom's intelligent filtering software, you can reduce non-actionable alarms and escalate to the appropriate care teams.

Ready to learn more?

After reading this guide, you should feel more informed in your journey to implementing smarter alarming and alerting capabilities in your health system. If you'd like to see firsthand the benefits of the Ascom smarter alarming and alerting solution, we can show you in a live demonstration either in person at our Ascom Center of Excellence (ACE) or virtually. Book your session in our online form through our website. Or email us at ascommarketing@ascom.com to speak with an Ascom sales director or one of our channel partners in your area.

Smart alarming and alerting terms to know

Advanced alarm filtering – using clinical rules to filter alarms and provide notifications and alerts based on acquired patient physiologic parameters and assessments against thresholds and/or early warning scoring to determine the appropriate response in a healthcare setting

Augmented intelligence – the term used to describe when you combine the capabilities of artificial intelligence with human decision making to make a data informed care decision

Automation – using technologies in healthcare, such as AI, workflows, predictive analytics and more to increase nursing efficiency

Clinical communications and collaboration – describes the process for nurses in a hospital setting that combines technology solutions and human workflows to proactively and reactively respond to patient and care team needs

Clinical surveillance – often referred to as a single pane of glass, it is an umbrella term for data aggregation and synthesis from connected medical devices in a variety of care environments. Command centers, virtual nursing and remote patient monitoring are examples of clinical surveillance models

Clinical workflow consulting – the process of experienced clinicians on staff at a technology company partnering with a hospital customers' nursing team to understand, analyze and design an effective process that combines workflow technology solutions with optimal ways of working

Complexity of continuum – this term explains the effective coordination of care throughout the patient's healthcare journey

Digital transformation – is used in healthcare to describe the rapid adoption of new technologies, from the "digital front door" for front of house operations like scheduling, check in and billing to clinical workflows and operations affecting patient care

Early warning scoring – this score is a fast way for medical professionals to evaluate the severity of a patient's condition to identify ones who are deteriorating by assigning a score based on their vital signs. This early insight lets caregivers prioritize care to those who need it most urgently

Enterprise – in healthcare, this term references how scalable technology solutions are for organizations to adopt across units, floors, facilities, etc.

FDA 510k compliance – this federal standard requires a company to submit medical devices to the US Food and Drug Administration before entering the market to show the safety and effectiveness of its product

Five 9s – 99.999% reliability of a product, the highest available

Force multiplier – technologies, and/or processes, that help equip healthcare systems with the ability to multiply the outcomes of a single solution to benefit patients and staff

Improving patient satisfaction – one of the goals of the Quadruple Aim that focuses on hospital effectiveness through measuring how satisfied patients are with the care they received while in the hospital

Improving staff responsiveness - a common goal, or KPI, and one of the eight domains of the hospital consumer assessment of healthcare providers and systems (HCAHPS) scoring that focuses on measuring how efficient and effective staff are to patient needs

Interoperability – refers to whether a product/solution, standard or protocol is designed to be compatible with a hospital's existing technologies to encourage more efficient and patient centered care

Smart alarming and alerting terms to know

Medical device integration – the extent to which technology solutions connect and interoperate with medical devices, such as ventilators, pulse oximeters, monitors, etc.

Near-real time alerting – filtering and sending clinical information to a nurse and/or escalation chain from primary alerting devices, such as monitors, to end points, such as PC monitors, command centers or mobile devices

Optimizing clinical workflows – the process of improving and continually refining nursing workflows via technology solutions

Patient journey – refers to the entire patient experience from entering the hospital through checkout and contains many touchpoints that influence the patient's perception of quality of care received

Predictive analytics – the process of collecting, filtering and using data through augmented intelligence to predict a patient's deterioration and/or escalation of care needed

Reducing alarm fatigue – a goal shared by many hospitals to reduce the number of alarms, many of them inactionable, going to nurses for a response

RMF framework certification – a certification that distinguishes products and solutions from their development lifecycle to adhere to the highest levels of security, privacy and cyber supply chain risk management activities

Role-based assignments – in hospital environments, this capability provides flexible configurability to assign workflows, alerts and alarms to caregivers and a defined escalation chain to ensure no alarm goes unanswered

ROI – return on investment for technology solutions that hospitals implement, which are expected to deliver quantified results, such as a decrease in length of stay, increase in throughput, reduction in falls, increase in patient satisfaction, and other measures

RTLS – real time locating systems used in healthcare facilities to automatically identify and track the location of nurses or staff or medical equipment and that integrates with clinical workflow technology solutions to improve KPIs like response time

Scalability – refers to the ability of a healthcare technology solution to be configured easily across units, floors, facilities and an entire health system

Smart nurse call – goes beyond traditional nurse call to include directly routing and prioritizing patient requests to their assigned caregiver or to a defined escalation chain

Staff safety/duress – the need for technology solutions through their features and capabilities to help prevent and respond to violence in the workplace in healthcare

Standardization – the collapsing of multiple architectures in healthcare technology to fewer, consolidated platforms that integrate with each other

SQL server – a popular relational database management system among healthcare systems to which nurse call software is mapped

Top of license – the ability for a nurse to perform duties at the highest level he or she is credentialed for, which ensures the hospital is operating its human resources efficiently

Smart alarming and alerting terms to know

Value based – the model of care that focuses on aligning the best patient outcomes per unit of cost

Virtual nursing model – equips hospitals with a virtual team of nurses to backup floor nurses and perform a variety of tasks, from administrative to consultative, and helps solve the nursing shortage challenges of the "experience gap" between new professionals and older, retiring nurses. This model relies on technology, such as cameras, speakers and nurse call integration

Workflow redesign – continually improving the clinical design sheet, which specifies the processes nurses follow in patient care and the role technology has in facilitating this

References:
1. Mitigating Alarm Fatigue and Improving Clinical Productivity – The Role of Intelligent Middleware in Providing Effective Care. Ascom Whitepaper. 2018.
2. Alarm Fatigue: The Human-System Interface, Clinical Nurse Specialist, The Journal for Advanced Practice, 2014.
3. Driving ROI. The Business Case for an Alarm Management/Patient Safety Solution, Hobson & Company, 2021.

ascom

Ascom Americas
300 Perimeter Park Dr.
Morrisville, NC 27560
USA
info@ascom.com
Phone: 877. 712.7266
ascom.com